

POSE-INVARIANT FACE RECOGNITION SYSTEM AND PROCESS

ABSTRACT OF THE DISCLOSURE

5 INS A face recognition system and process for identifying a person depicted in
an input image and their face pose. This system and process entails locating
and extracting face regions belonging to known people from a set of model
images, and determining the face pose for each of the face regions extracted.
All the extracted face regions are preprocessed by normalizing, cropping,
10 categorizing and finally abstracting them. More specifically, the images are
normalized and cropped to show only a persons face, categorized according to
the face pose of the depicted person's face by assigning them to one of a series
of face pose ranges, and abstracted preferably via an eigenface approach. The
preprocessed face images are preferably used to train a neural network
15 ensemble having a first stage made up of a bank of face recognition neural
networks each of which is dedicated to a particular pose range, and a second
stage constituting a single fusing neural network that is used to combine the
outputs from each of the first stage neural networks. Once trained, the input of a
face region which has been extracted from an input image and preprocessed
20 (i.e., normalized, cropped and abstracted) will cause just one of the output units
of the fusing portion of the neural network ensemble to become active. The
active output unit indicates either the identify of the person whose face was
extracted from the input image and the associated face pose, or that the identity
of the person is unknown to the system.

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